

# s88 Repeater

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For "refreshing" the data  
in long s88 bus lines

## Manual



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### Printing the manual

The formatting is optimised for double-sided printing. The standard page size is DIN A5. If you prefer a larger display, printing on DIN A4 is recommended.

## 1. Getting started

The instructions will help you step by step with the safe and proper installation and use of your s88 repeater. Before you put the repeater into operation, read this manual completely, especially the safety instructions and the section on possible errors and their elimination. You will then know what you have to pay attention to and thus avoid errors that sometimes can only be rectified with a lot of effort.

Keep the instructions in a safe place so that you can restore functionality later in the event of any malfunctions. If you pass the s88 repeater on to another person, also give the instructions with it.

### 1.1. Contents of the package

- 1 s88 repeater

Patch cables for connection to the s88 bus are not included in the scope of delivery.

### 1.2. Intended use

The s88 repeater is intended for use in model railway layouts as specified in the instructions. Any other use is not in accordance with the intended use and will result in the loss of the warranty claim. Intended use also includes reading, understanding and following all parts of the instructions. The s88 repeater is not intended to be used by children under the age of 14.

### 1.3. Safety instructions

Improper use and non-observance of the instructions can lead to incalculable hazards. Prevent these dangers by carrying out the following measures:

- Only use the s88 repeater in closed, clean and dry rooms. Avoid moisture and splash water in the environment. After condensation has formed, wait two hours for acclimatisation before use.
- Disconnect devices that are connected to the s88 repeater from the power supply before carrying out wiring work.
- Only supply devices that you connect to the s88 repeater with extra-low voltage as specified in the technical data. Only use tested and approved transformers for this purpose.
- Only plug the mains plugs of transformers into properly installed and fused earthed sockets.
- Do not expose the s88 repeater to high ambient temperatures or direct sunlight. Observe the information on the maximum operating temperature in the technical data.
- Regularly check the operational safety of the s88 repeater and the connected devices, e.g. for damage to the connection cables.
- If you notice damage or if malfunctions occur, disconnect the connection to the power supply immediately. Send the s88 repeater in for inspection.

## 2. Operation overview and connections



### Info: Standard s88-N

The standard s88-N regulates the assignment of commercial Ethernet patch-cables for use in s88 feedback systems. Unlike the 6-conductor connecting cables frequently used, the patch-cables used in computer networks are screened against outside electric signals. Thus using patch-cables reduces the liability to interference considerably.

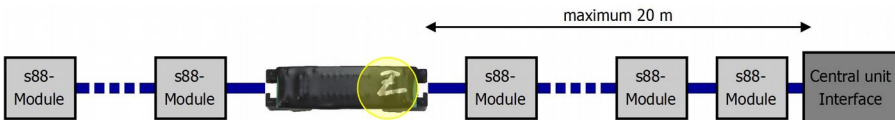
### Mode of operation

When using screened patch-cables with RJ-45 connections in s88 bus systems corresponding to the standard s88-N even laying long data lines do not pick up interference. With transmission paths of more than 30 m, however, the datasignal's edges smooth down and get round – as in all bus systems. This can result in faulty messages due to singular bits so to speak "getting lost" during data transfer and thus the bits' sequence being shifted.

The s88-repeaters should be mounted on the s88-data line at distances of approx. 20 m. They post-process the signals so that a correct data signal with angular edges is provided at their outputs.

### Mounting the s88-Repeater

Mount the s88-repeater at a distance of approx. 20 m from the control unit or the s88-interface into the data line, measured over all cables connecting the control unit or the interface and all s88-feedback modules for the concerned data line. If necessary, mount additional s88-repeaters into the data line at distances of 20 m each.



Connect the s88-repeater via the RJ-45-connections to the data cables. The end marked with "Zentrale" on it's bottom should point in the direction of the digital control unit / the interface.

### 3. Checklist for troubleshooting and error correction

There is no feedback data transferred from modules mounted behind the repeater (seen from the control unit).

Possible cause:

- The repeater has been mounted the wrong way round. → Check if the repeater's end marked with "Z" is pointing into the direction of the control unit / the interface and, if necessary, mount the repeater the other way round.

#### 3.1. Technical Hotline

If you have any questions about the use of your s88 repeater, our technical hotline will help you (telephone number and e-mail address on the last page).

#### 3.2. Repairs

You can send us a defective s88 repeater for repair (address on the last page). In the event of a warranty or guarantee claim, the repair is free of charge for you. As proof of any warranty or guarantee claim, please enclose the proof of purchase with your return.

If there is no warranty or guarantee claim, we are entitled to charge you the costs of the repair and the costs of the return shipment. We charge a maximum of 50% of the new price for the repair according to our valid price list. We reserve the right to refuse the repair if it is technically impossible or uneconomical.

If you want to clarify whether a repair is possible or economical before sending it in, please contact our Technical Hotline (telephone number and email address on the last page).

Please do not send us repair shipments freight collect. In the event of a warranty or guarantee claim, we will reimburse you for the regular shipping costs.

## 4. Technical data

### Data protocols and interfaces

Data protocols	s88
Interfaces for s88 bus	2 RJ-45 sockets according to S88-N


### Electrical characteristics

Power supply	via the s88 bus
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### Protection

Protection class	IP 00 Meaning: No protection against foreign bodies, contact and water.
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### Environment

	For use in closed rooms
Ambient temperature during operation	0 ~ + 30 °C
Permissible relative humidity during operation	10 ~ 85% (non-condensing)
Ambient temperature during storage	- 10 ~ + 40 °C
Permissible relative humidity during storage	10 ~ 85% (non-condensing)

### Other features

Dimensions (approx.)	66 x 17 x 16 mm
Weight (approx.)	12,5 g

## 5. Warranty, EU conformity & WEEE

### 5.1. Guarantee bond

For this product we issue voluntarily a guarantee of 2 years from the date of purchase by the first customer, but in maximum 3 years after the end of series production. The first customer is the consumer first purchasing the product from us, a dealer or another natural or juristic person reselling or mounting the product on the basis of self-employment. The guarantee exists supplementary to the legal warranty of merchantability due to the consumer by the seller.


The warranty includes the free correction of faults which can be proved to be due to material failure or factory flaw. With kits we guarantee the completeness and quality of the components as well as the function of the parts according to the parameters in not mounted state. We guarantee the adherence to the technical specifications when the kit has been assembled and the ready-built circuit connected according to the manual and when start and mode of operation follow the instructions.

We retain the right to repair, make improvements, to deliver spares or to return the purchase price. Other claims are excluded. Claims for secondary damages or product liability consist only according to legal requirements.

Condition for this guarantee to be valid, is the adherence to the manual. In addition, the guarantee claim is excluded in the following cases:

- if arbitrary changes in the circuit are made,
- if repair attempts have failed with a ready-made module or device,
- if damaged by other persons,
- if damaged by faulty operation or by careless use or abuse.

## 5.2. EU Declaration of Conformity

 This product fulfils the requirements of the following EU directives and therefore bears the CE marking.

2001/95/EU Product Safety Directive

2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS)

## 5.3. Declarations on the WEEE Directive

This product is subject to the requirements of the EU Directive 2012/19/EC on Waste Electrical and Electronic Equipment (WEEE), i.e. the manufacturer, distributor or seller of the product must contribute to the proper disposal and treatment of waste equipment in accordance with EU and national law. This obligation includes

- registration with the registering authorities ("registers") in the country where WEEE is distributed or sold
- the regular reporting of the amount of EEE sold
- the organisation or financing of collection, treatment, recycling and recovery of the products
- for distributors, the establishment of a take-back service where customers can return WEEE free of charge
- for producers, compliance with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive.



The "crossed-out wheeled bin" symbol means that you are legally obliged to recycle the marked equipment at the end of its life. The appliances must not be disposed of with (unsorted) household waste or packaging waste. Dispose of the appliances at special collection and return points, e.g. at recycling centres or at dealers who offer a corresponding take-back service.









Further Information and Tips:

<http://www.tams-online.de>

Warranty and Service:

Tams Elektronik GmbH

Fuhrberger Straße 4  
DE-30625 Hannover

fon: +49 (0)511 / 55 60 60

fax: +49 (0)511 / 55 61 61

e-mail: [modellbahn@tams-online.de](mailto:modellbahn@tams-online.de)

